Photoelectrical properties investigated on individual Si nanowires and their size dependence

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1. Current images of Si NWs with different diameters under different laser irradiation

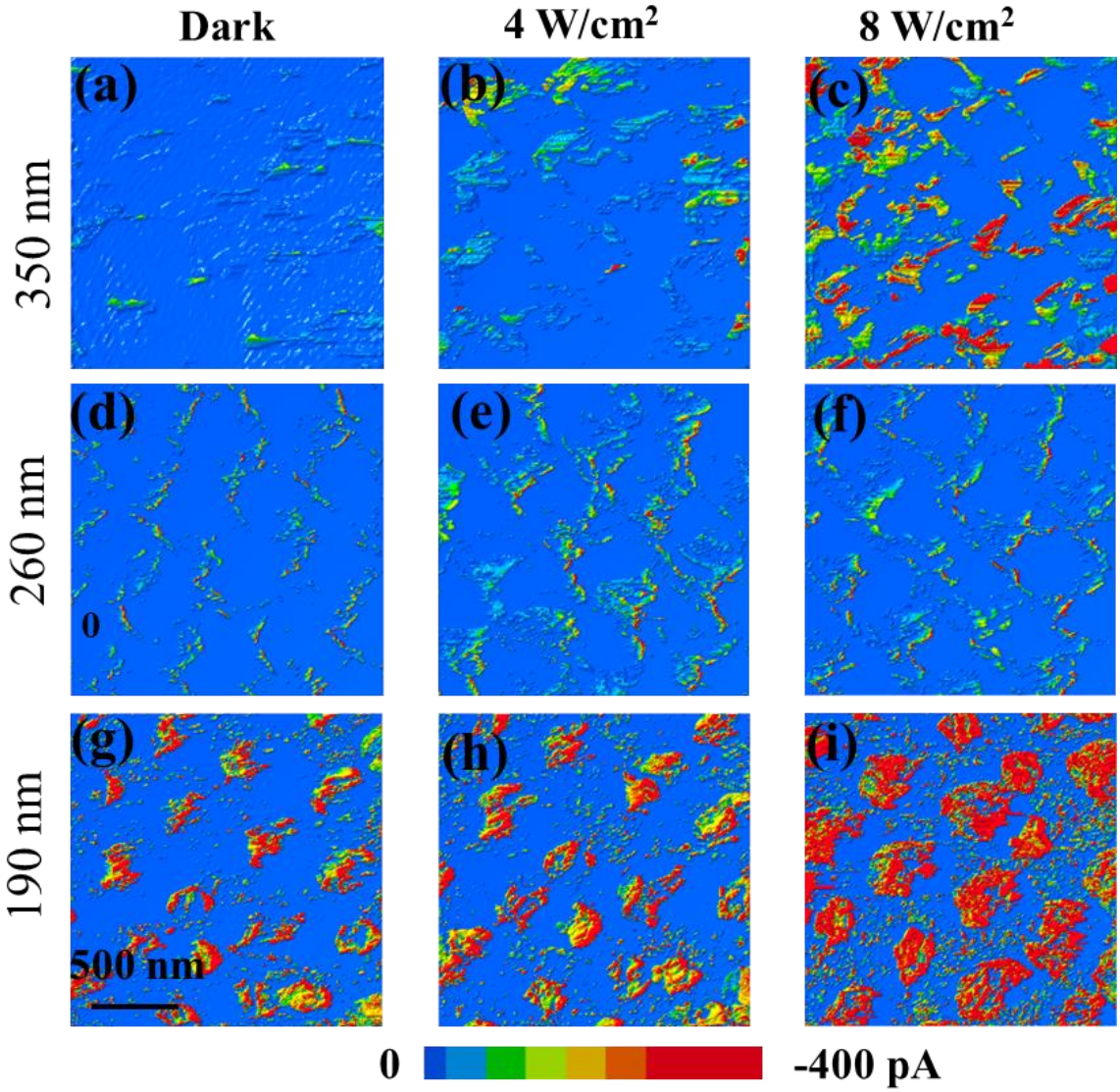

Fig. S1 The current images of Si NWs with the same length of 350 nm but different diameters: (a)-(c) 350 nm; (d)-(f) 260 nm; and (g)-(i) 190 nm under the laser intensities of 0, 4 and 8 W/cm^2.

2. Current images of Si NWs with different lengths under different laser irradiation

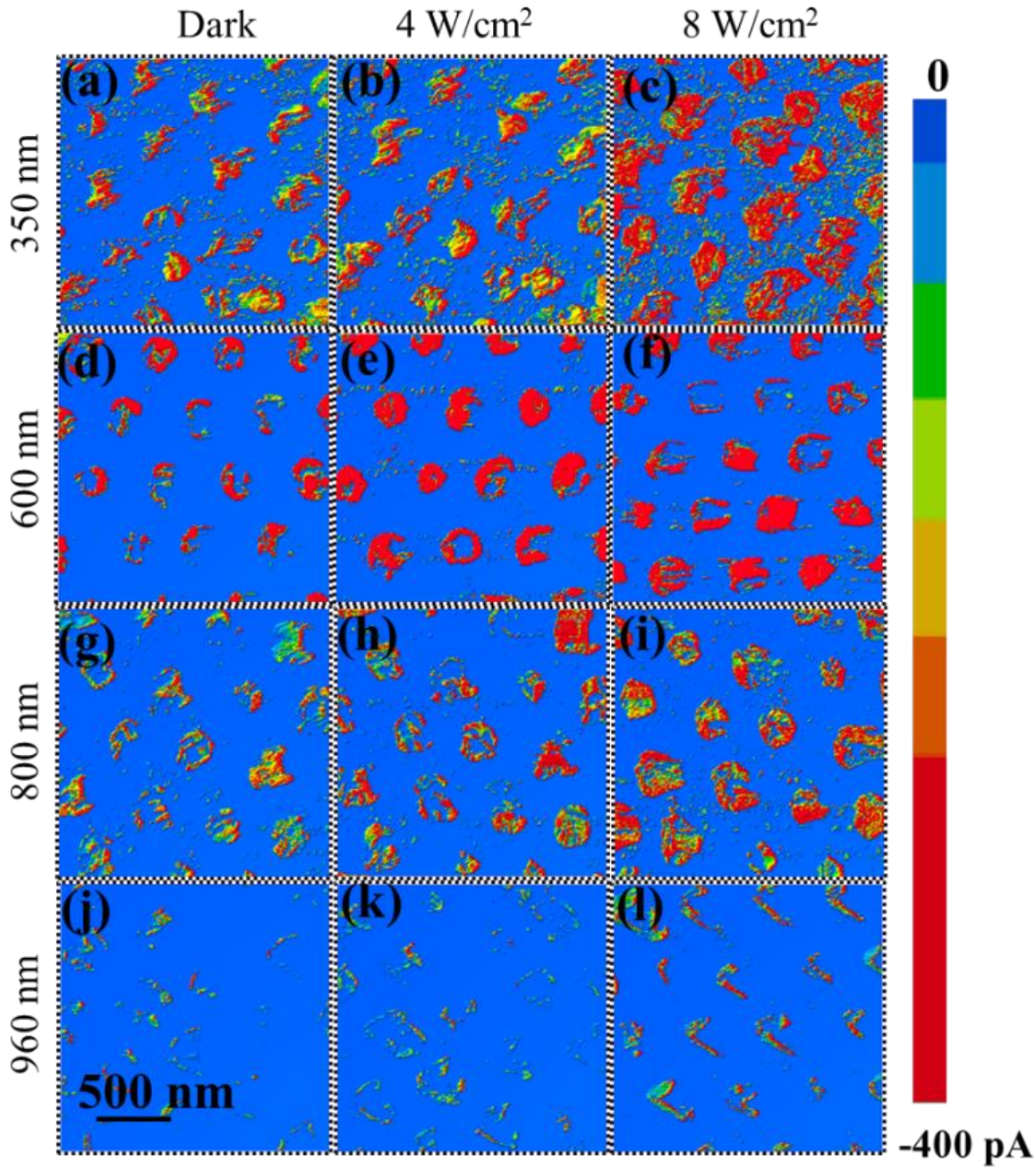

Fig. S2 The current images of Si NWs under the laser intensity of 0, 4 and 8 W/cm^2 with the same diameter of 190 nm but different lengths: 350 nm: (a)-(c); 600 nm: (d)-(f); 800 nm:(g)-(i); 960 nm: (j)-(l).

3. Schottky barrier heights of Si NWs with different diameters and lengths

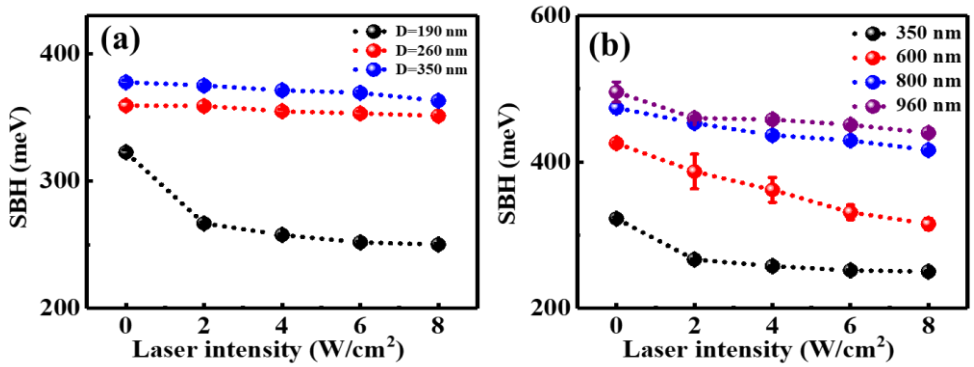

Fig. S3 The Schottky barrier heights obtained from the fitting results as a function of laser intensity for Si NWs with different diameters (a) and different lengths (b), respectively.

4. Schematic energy band diagram of the tip-sample contact

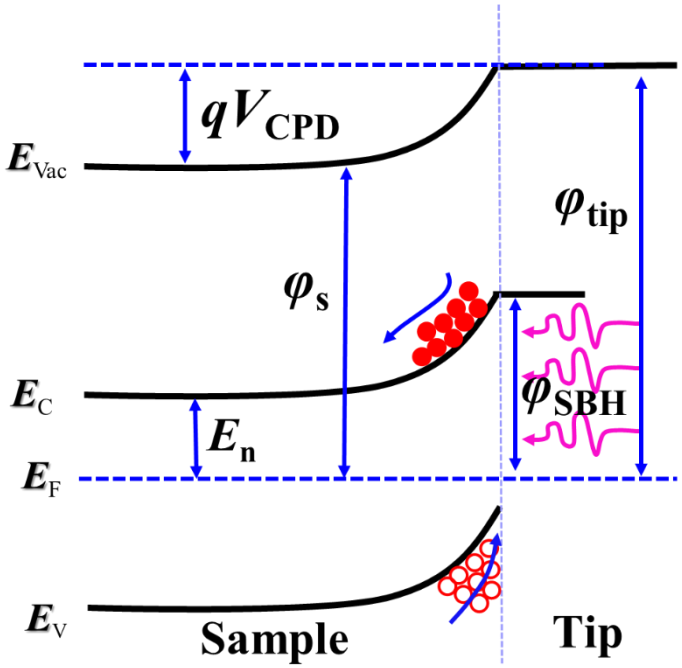

Fig. S4 Energy band diagram of the contact interface between the metallic tip and n-type Si nanowire. V_{CPD} is the contact potential difference and the value of SBH roughly equals to the sum of qV_{CPD} and E_n.

5. Contact potential difference results obtained on different series of Si NWs.

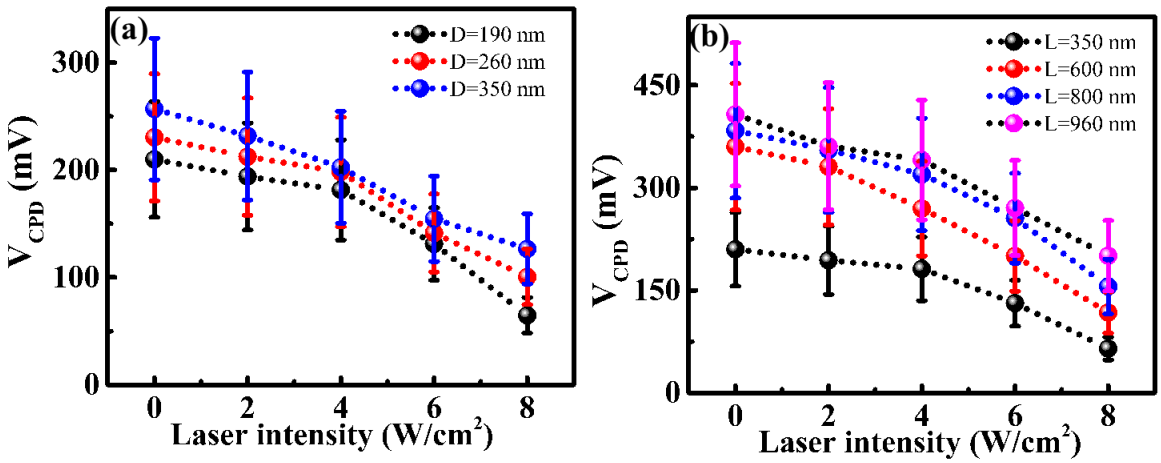

Fig. S5 Contact potential difference (V_{CPD}) obtained from the fitting results as a function of laser intensity on Si NWs with different diameters (a) and different lengths (b).